

USER MANUAL

MHT3500 *Series HUMIDITY TRANSMITTER*

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**CAUTION!**

Failure to follow these instruction may result damage to instrument

**WARNING!**

Failure to follow these instruction may result in serious injury or death

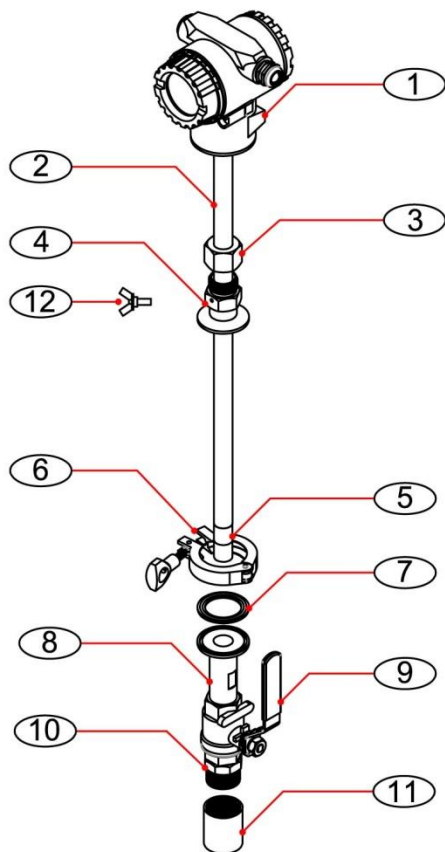
1.0 Technical Specification

Supply	24VDC
Range	0...100%RH
Ambient temperature	-40...70°C
Storage temperature	-40...70°C (without condensing)
Output	4...20mA (2 wires system)
Accuracy	± 3% FS
Long term stability	≤ 0.05%/year
Response time	≤ 200ms (with damping time setting to 0)
Switch on delay	≤ 5sec
Humidity limit	5...100%RH (at 40°C)
Load	Max. (V _{power supply} -15V)/0.02A (with backlight)
HART loop resistance	250...550Ω
Process connection	Insertion (Hot tapping)
Reverse polarity protection	No damage and also no function
Short circuit protection	Permanent
Electromagnetic compatibility (EMC)	Interference immunity and interference emission compliance to IEC61000-4-3:1995

**CAUTION!**

DO NOT disassemble the transmitter without technical assistance, else the product will not be under warranty for any faulty or damage.

2.0 Parts Description



1	Housing/ Enclosure
2	Sensor probe
3	Compression bush
4	Top ferrule
5	Transducer
6	Triclamp
7	Seal pad
8	Bottom ferrule
9	1" Isolating valve
10	Stainless steel nipple
11	1" Welding socket
12	Lock tight nut

Figure 2.0 Humidity transmitter parts description and supply scope

3.0 Mechanical Installation

Following condition required to select installation location:

1. Select location with minimum vibration and shock
2. Select location where the transmitter is easy for maintenance
3. Avoid installation of transmitter on the environment condition which exposed to corrosive atmosphere, adequate ventilation required to prevent intrusion
4. Avoid location where the ambient temperature with wide fluctuation

In order to maintain the life span, accuracy and performance of transmitter, condition above required to be taken into consideration during installation.



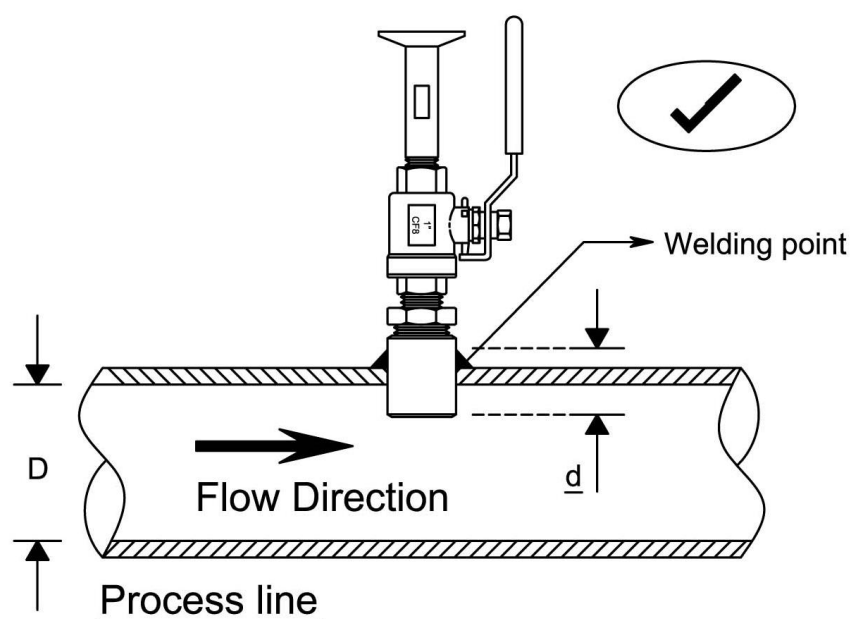
Warning!

Failure to follow these instruction may result in serious injury or death

Note:

- Never install the transmitter on the line operating pressure which is higher than specific maximum working pressure
- Never install the transmitter under high pressure condition, during the process is running or without any isolating valve
- Drained off the medium before installation/ dismantle if the process medium is harmful or toxic
- Improper installation will lead to leakage problem
- Do not apply on the process medium that contain solid particles or high viscosity

3.1 Mounting Condition



NOTE :

- * The welding socket insertion depth **MUST** be $1/2d$ into pipeline, to ensure the transducer able to insert into pipeline without any blockage

Figure 3.0 Installation of welding socket on pipeline (Correct method)

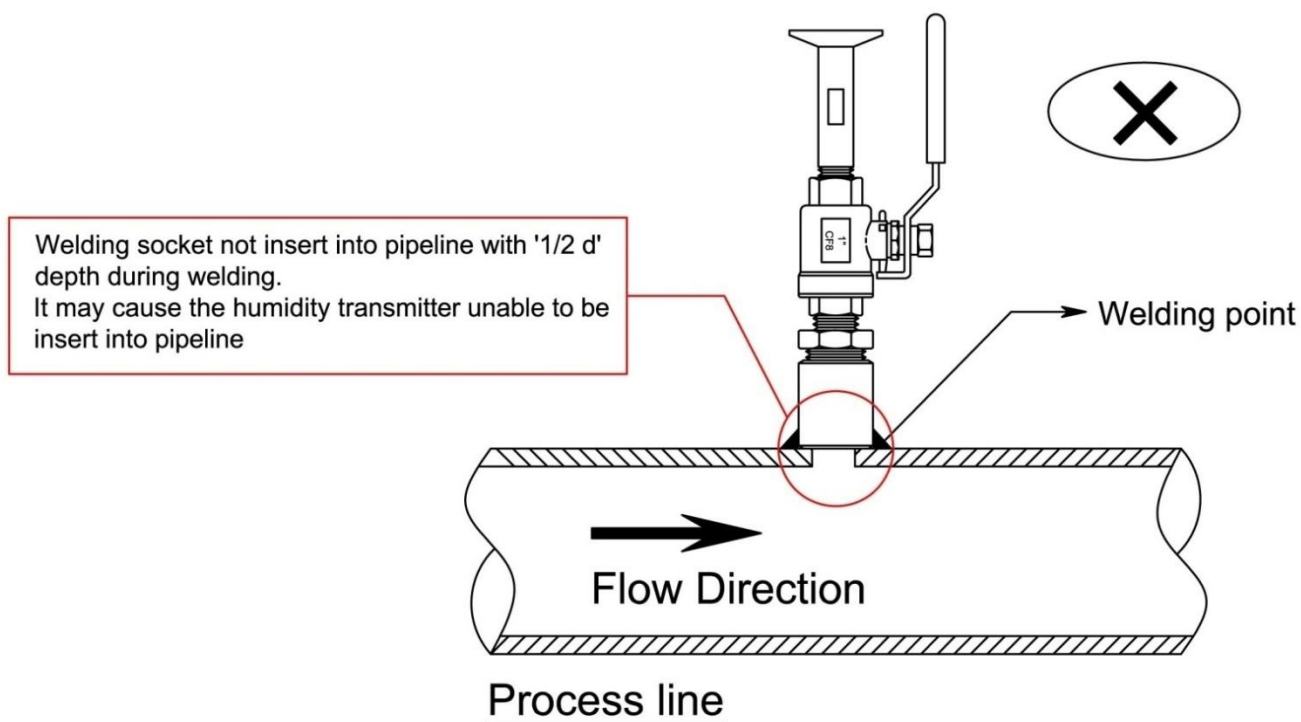
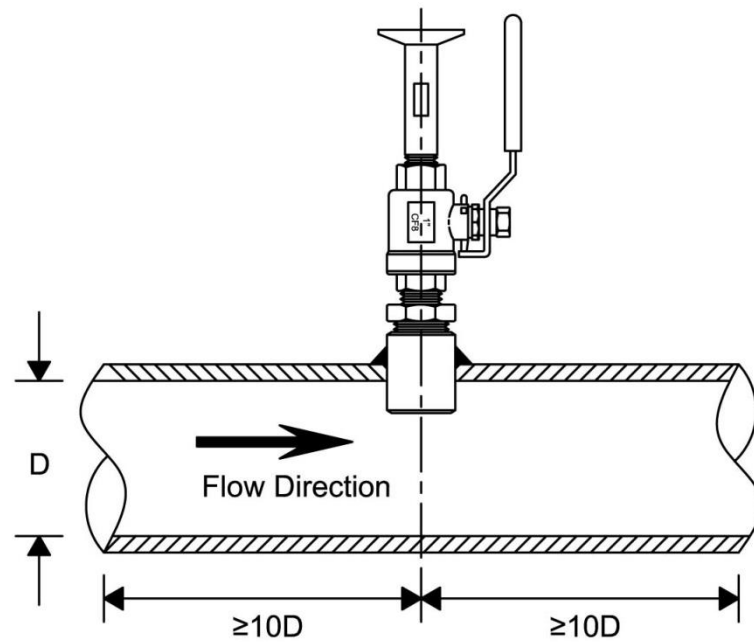


Figure 3.1 Installation of welding socket on pipeline (Wrong method)

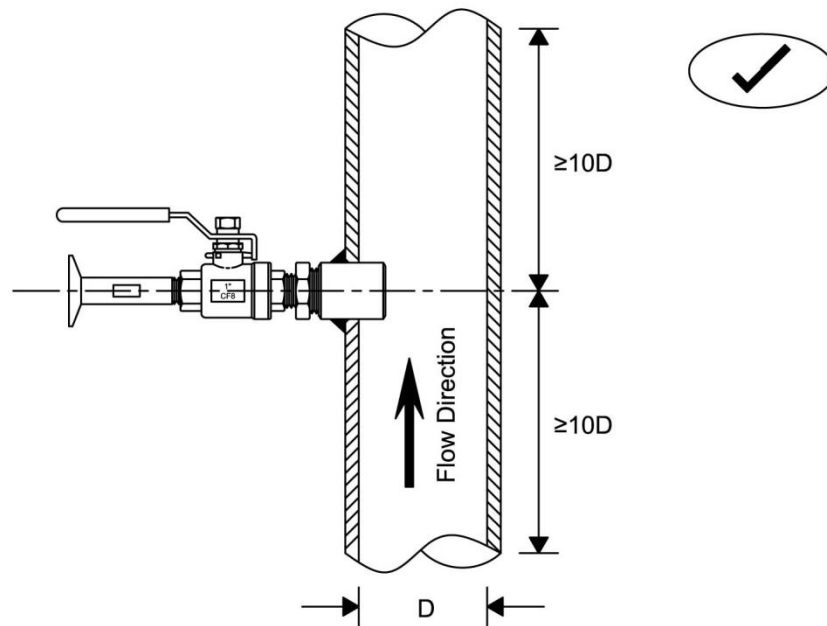
3.2 Installation Location Consideration



NOTE :

- * Minimum straight pipe length requirement :
Before humidity transmitter is $\geq 10D$ and after humidity transmitter is $\geq 10D$

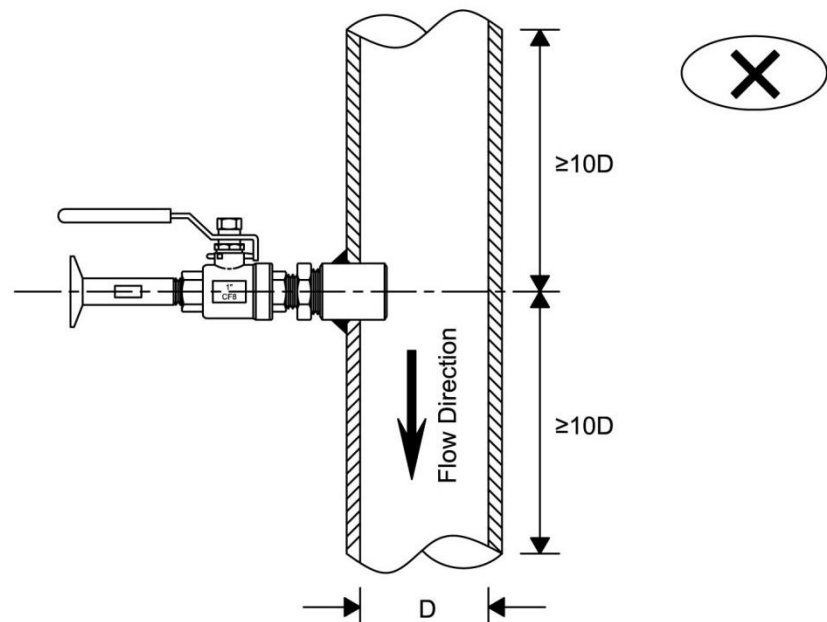
Figure 3.2 Minimum straight pipe length requirements for installation of humidity transmitter (Horizontal pipeline)



NOTE :

- * Minimum straight pipe length requirement :
Before humidity transmitter is $\geq 10D$ and after humidity transmitter is $\geq 10D$
- * For vertical pipeline, the flow direction MUST be from downward to upward

Figure 3.3 Minimum straight pipe length requirements for installation of humidity transmitter (Vertical pipeline orientation) – Correct Installation

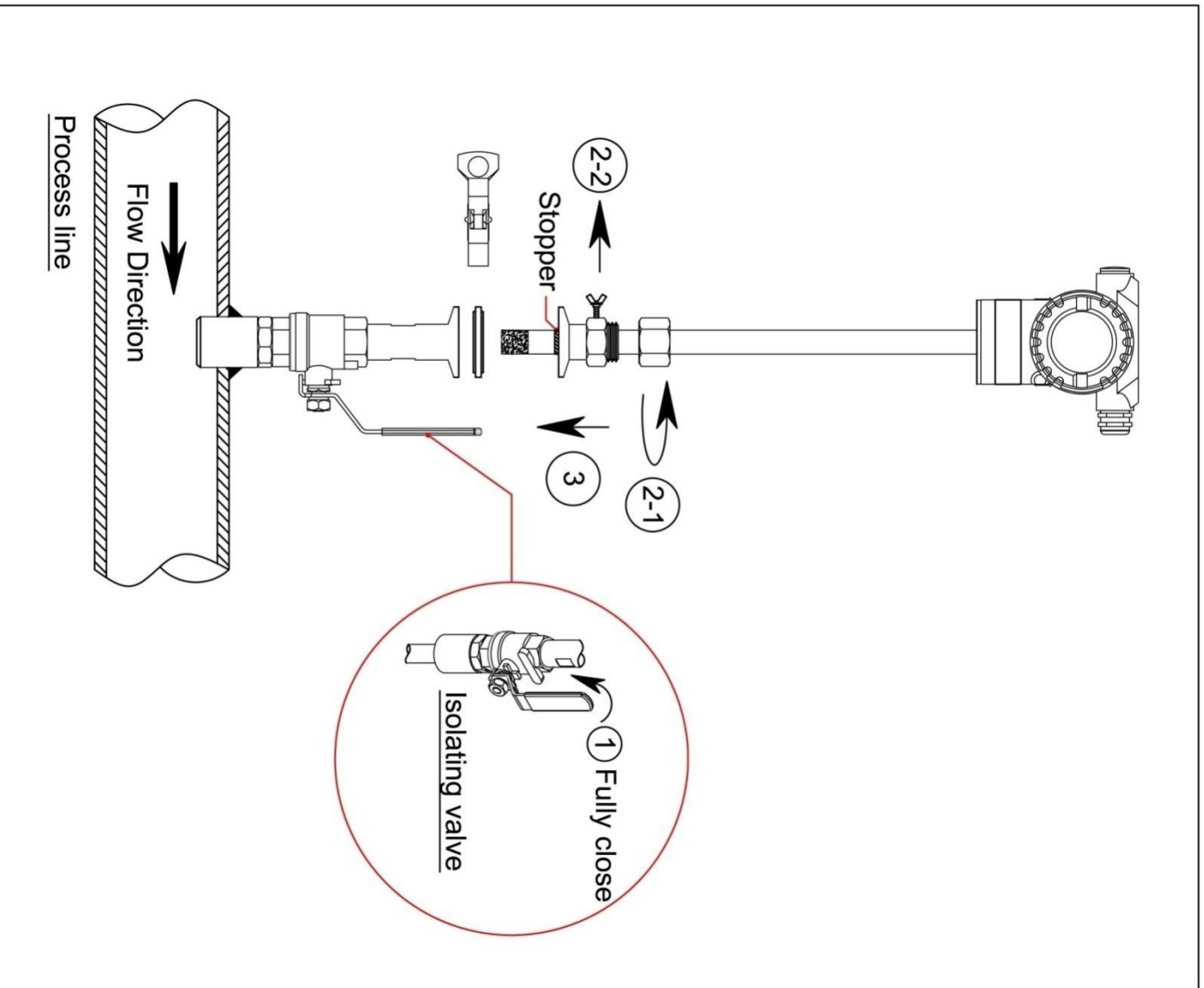


NOTE :

- * For vertical pipeline, the flow direction upward to downward is NOT ALLOWED

Figure 3.4 Minimum straight pipe length requirements for installation of humidity transmitter (Vertical pipeline orientation) – **Wrong Installation**

3.3.0 Installation Guide of Humidity Transmitter (Hot Tapping Insertion): 1/3



Steps :

- 1 Ensure isolating **FULLY CLOSE**
- 2 (2-1) Slacken the compression bush & (2-2) Loosen the lock tight nut
- 3 Slide down the top ferrule till the stopper of humidity transmitter

Figure 3.5 Installation of humidity transmitter into process line (Hot tapping insertion)

3.3.1 Installation Guide of Humidity Transmitter (Hot Tapping Insertion): 2/3

Steps :

- 4 Slot in the transmitter into bottom ferrule
- 5 Clamp the top and bottom ferrule with the triclamp

NOTE :

Ensure the seal pad is in between top and bottom ferrule before clamp with triclamp in order to prevent leakage during operation

- 6 Tight the compression bush
- 7 (7-1) Fully open the isolating valve & (7-2) Insert the humidity transmitter into process line

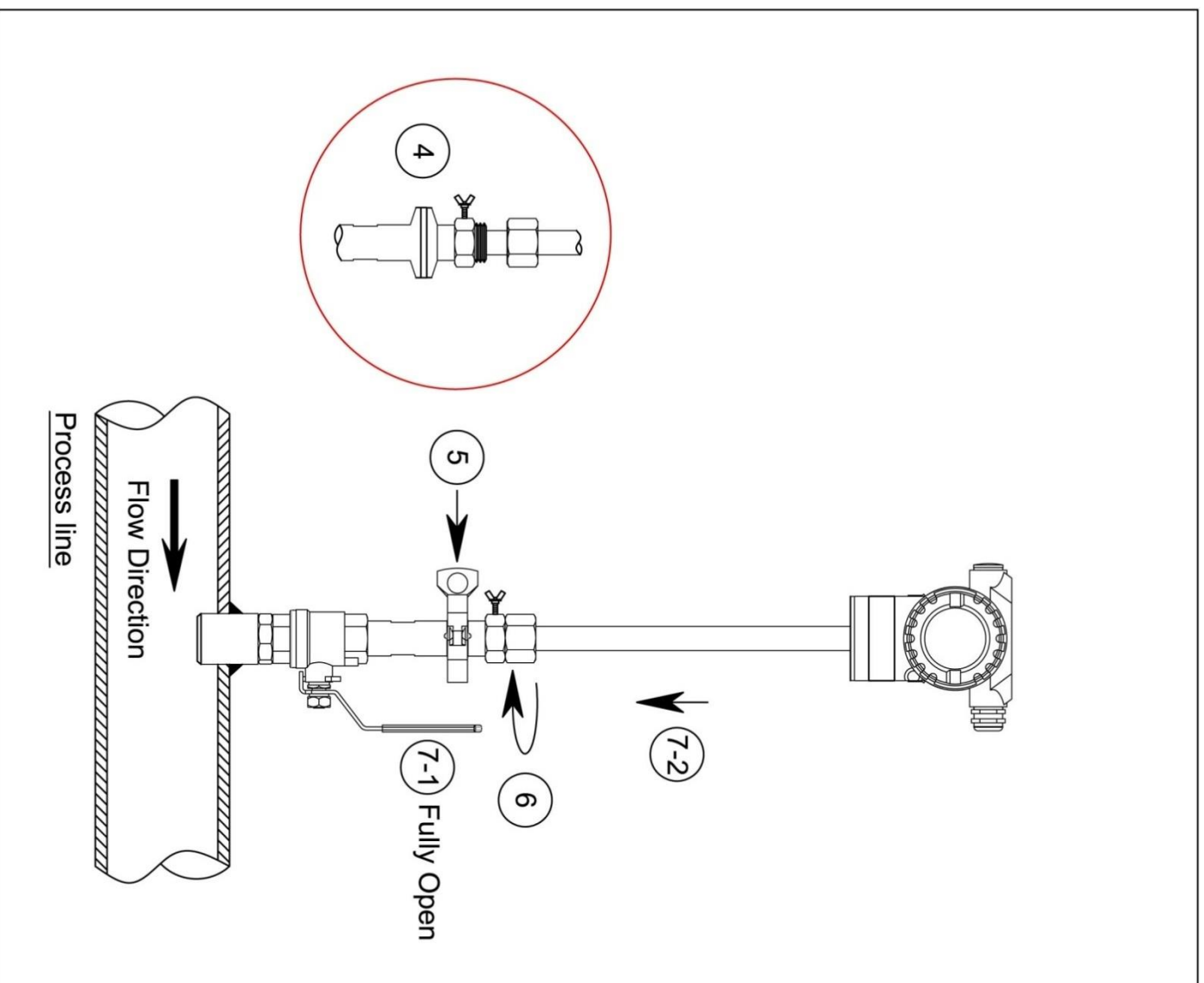
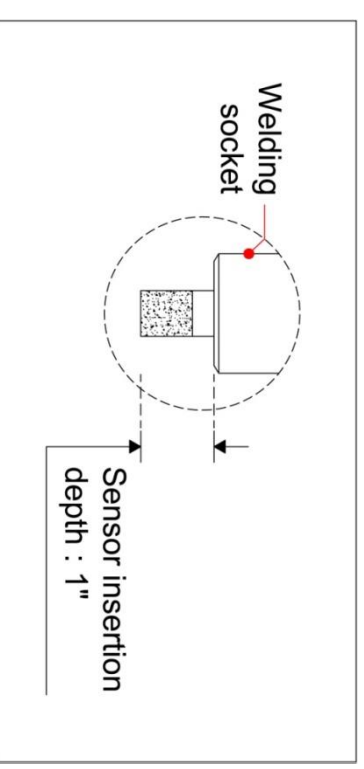


Figure 3.6 Installation of humidity transmitter into process line (Hot tapping insertion)

3.3.2 Installation Guide of Humidity Transmitter (Hot Tapping Insertion): 3/3

▪ Steps :

- 8 Ensure the insertion depth of transmitter into pipeline is 1"



- 9 Tighten the lock tight nut

- 10 Last, the humidity transmitter is ready to be in service

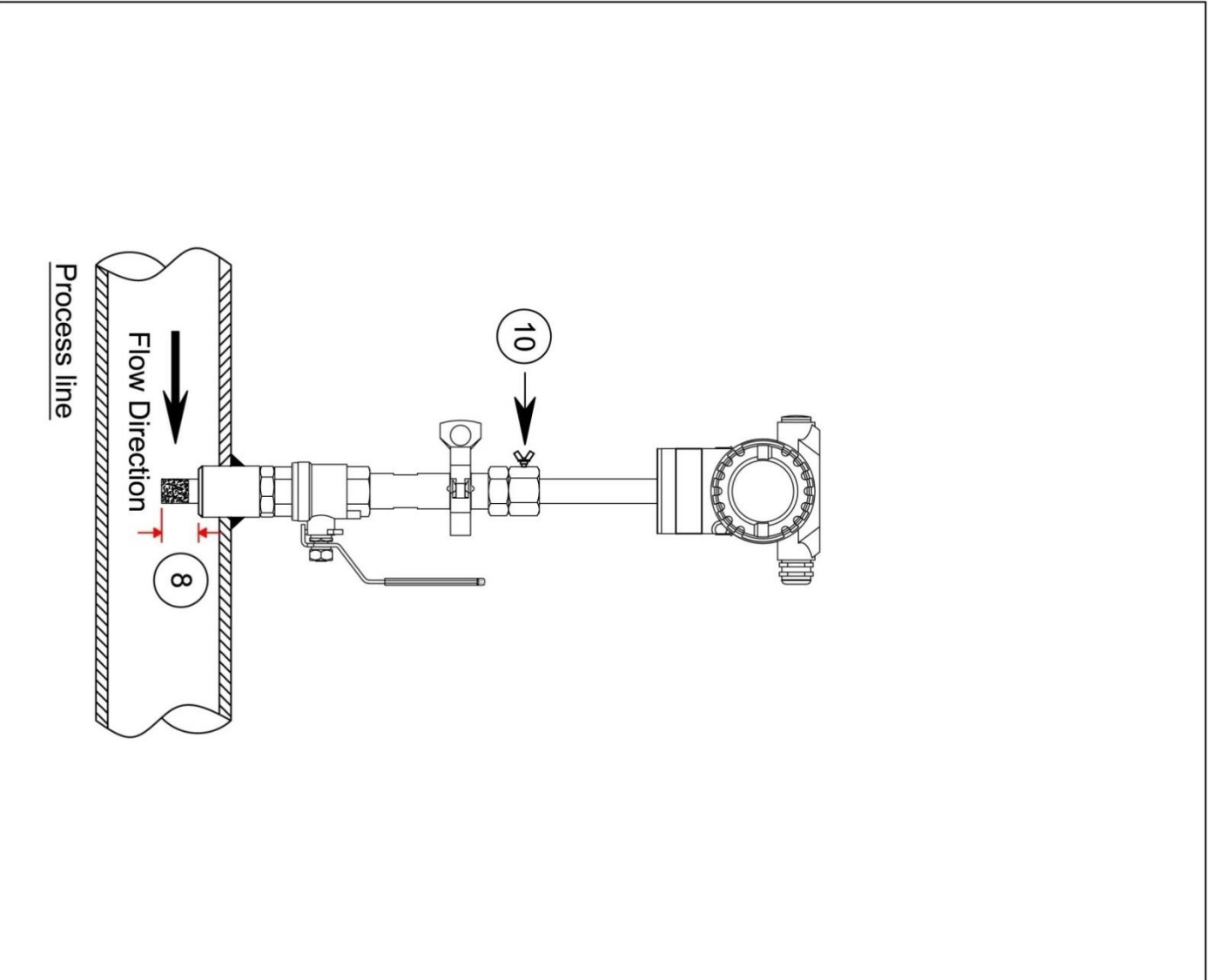
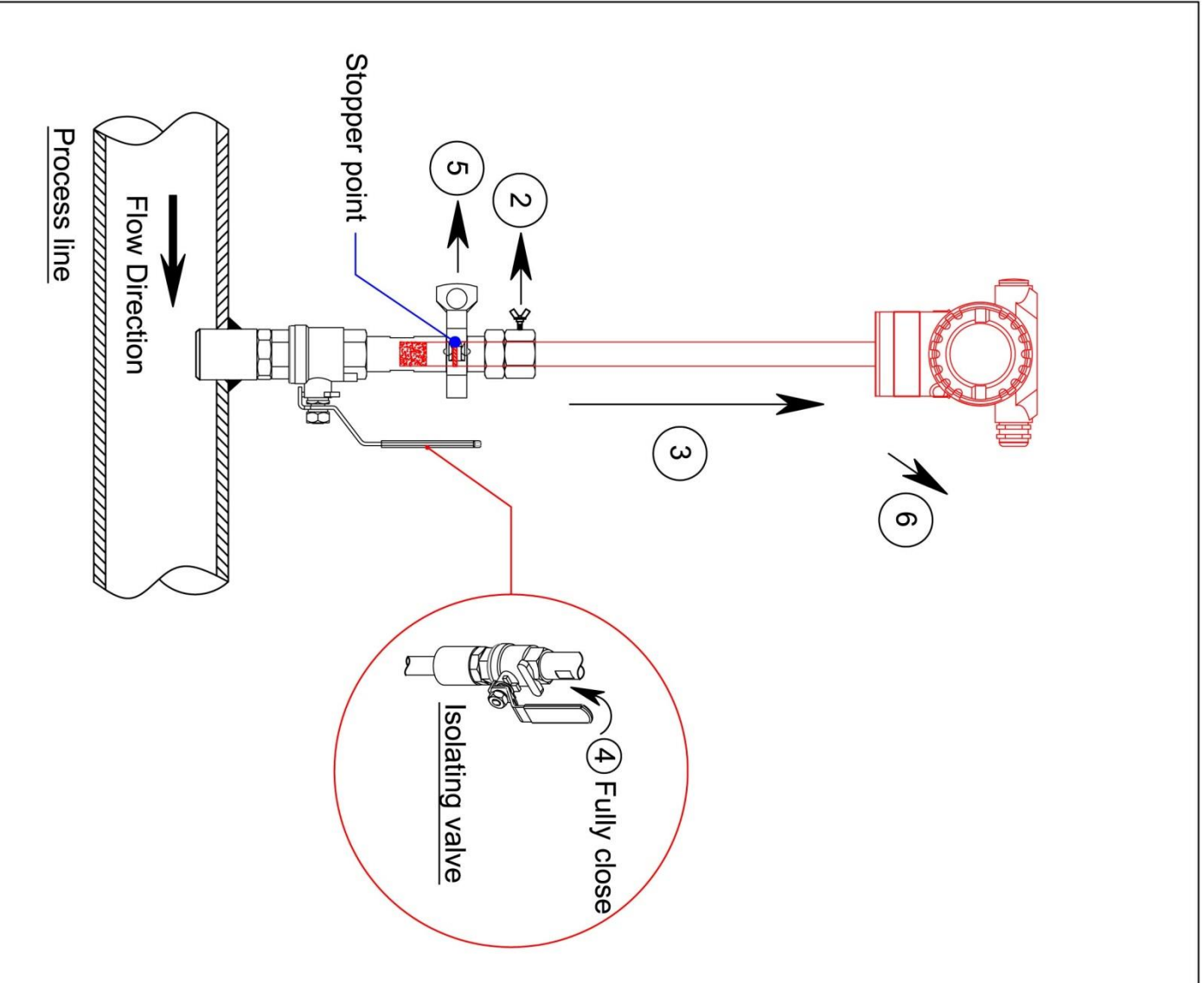


Figure 3.7 Installation of humidity transmitter into process line (Hot tapping insertion)

3.4.0 Removal of Humidity Transmitter from Process Line: 1/2

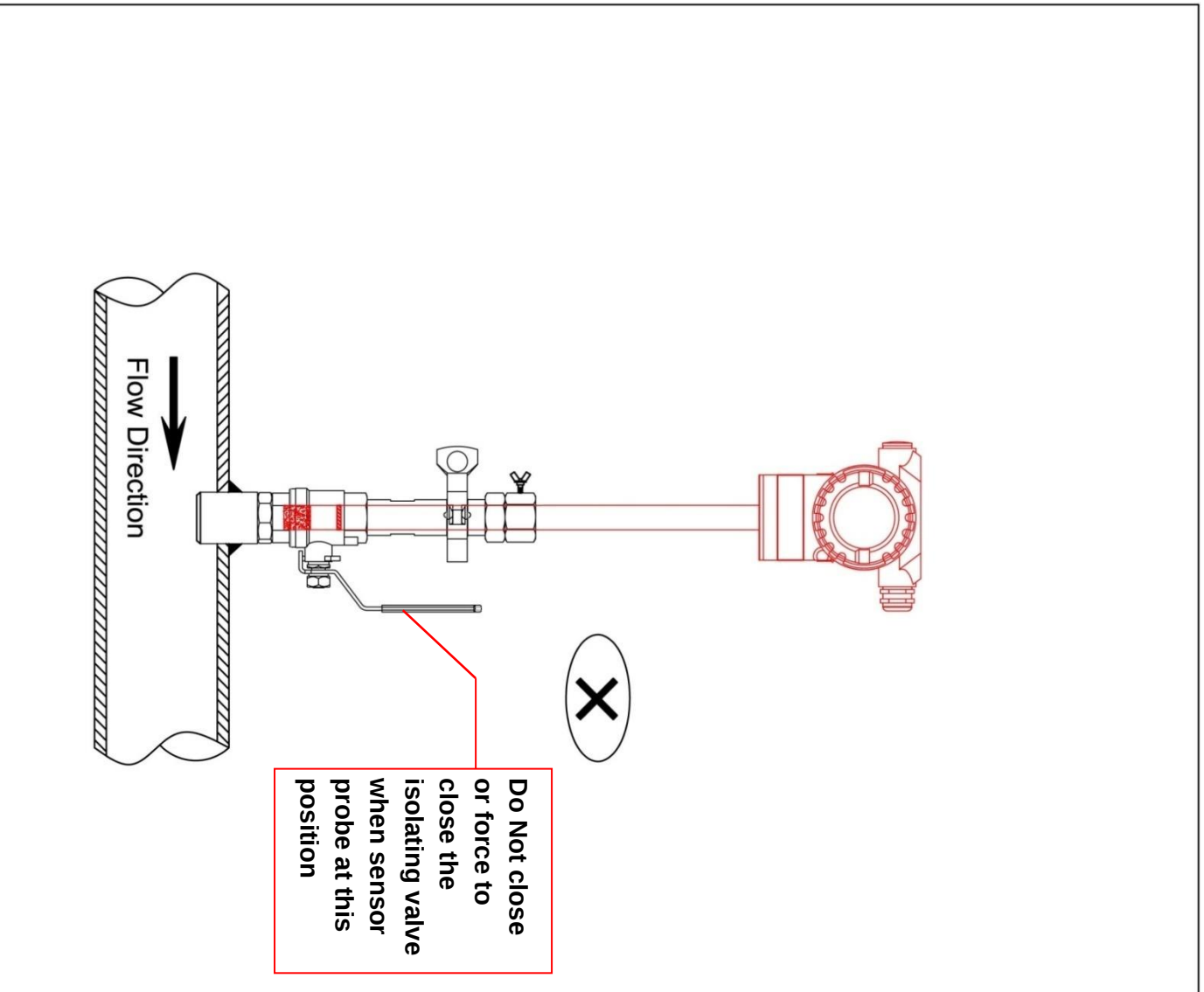


Steps :

- 1 Turn off the power supply that supplied to transmitter
- 2 Loosen the lock tight nut
- 3 Fully retract the sensor probe from the process line till the stopper point reach the top part of the ferule
- 4 Fully close the isolating valve
- 5 Open and remove the triclamp
- 6 Remove the transmitter

Figure 3.8 Removal of humidity transmitter from process line

3.4.1 Removal of Humidity Transmitter from Process Line: 2/2



▪ Note :

DO NOT close or force to close the isolating valve when the sensor probe is not fully retracted. Failure to follow instruction will lead to damage to the sensor

Figure 3.9 Improper method of removal of humidity transmitter from process line

4.0 Electrical Connection

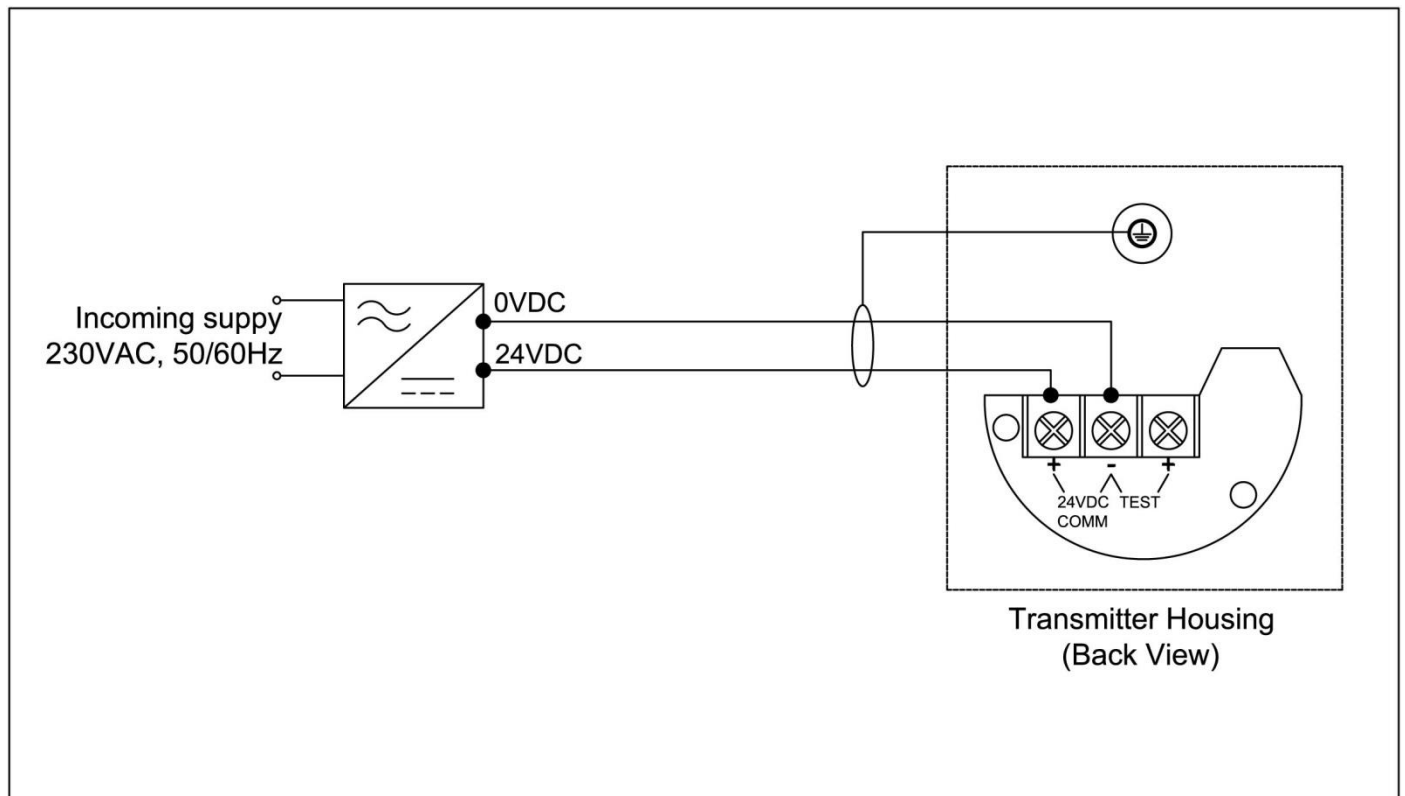


Figure 4.0 Wiring connection of power supply to transmitter

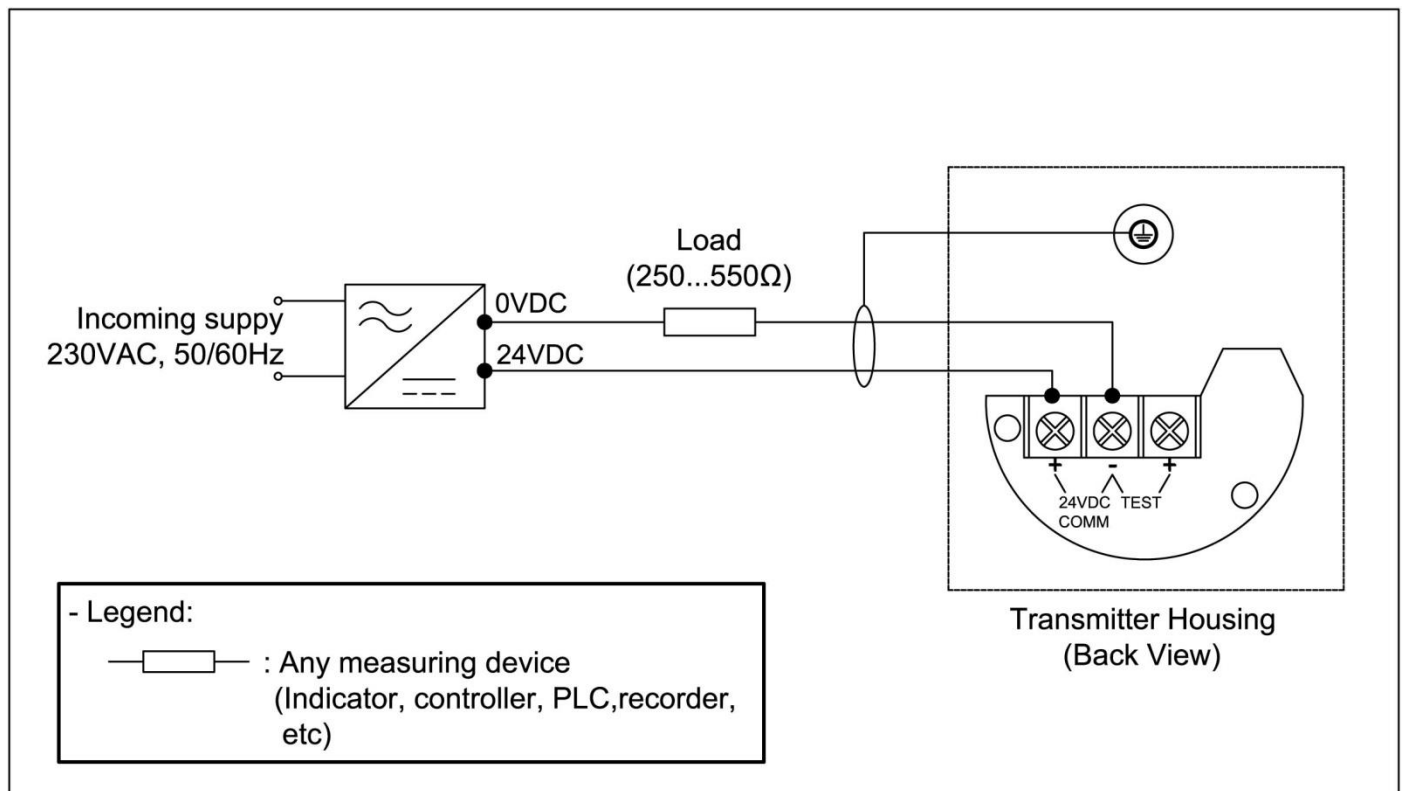


Figure 4.1 Wiring loop configuration

4.1 Wiring: HART Communication

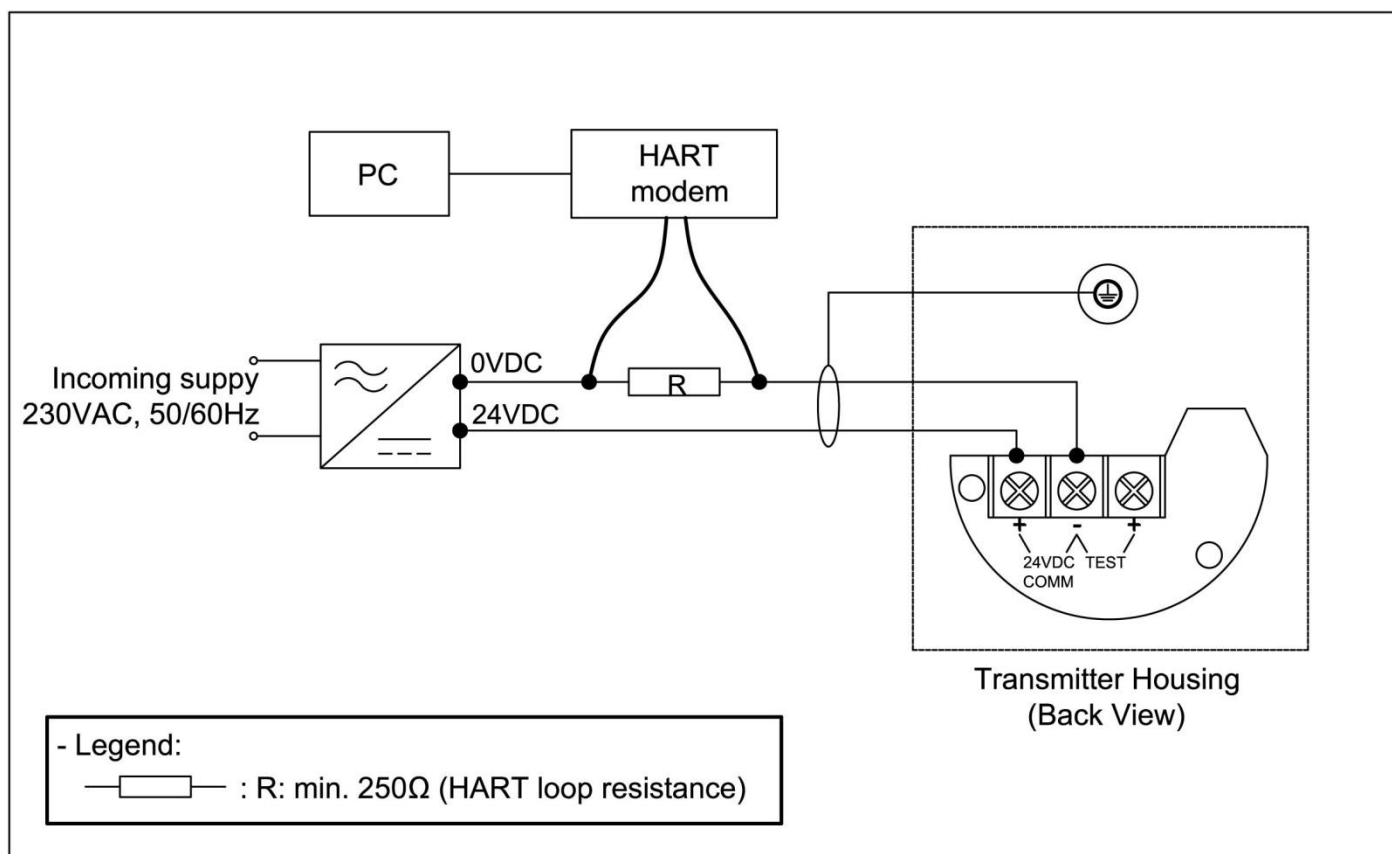


Figure 4.2 Wiring connection of HART configuration (HART Modem)

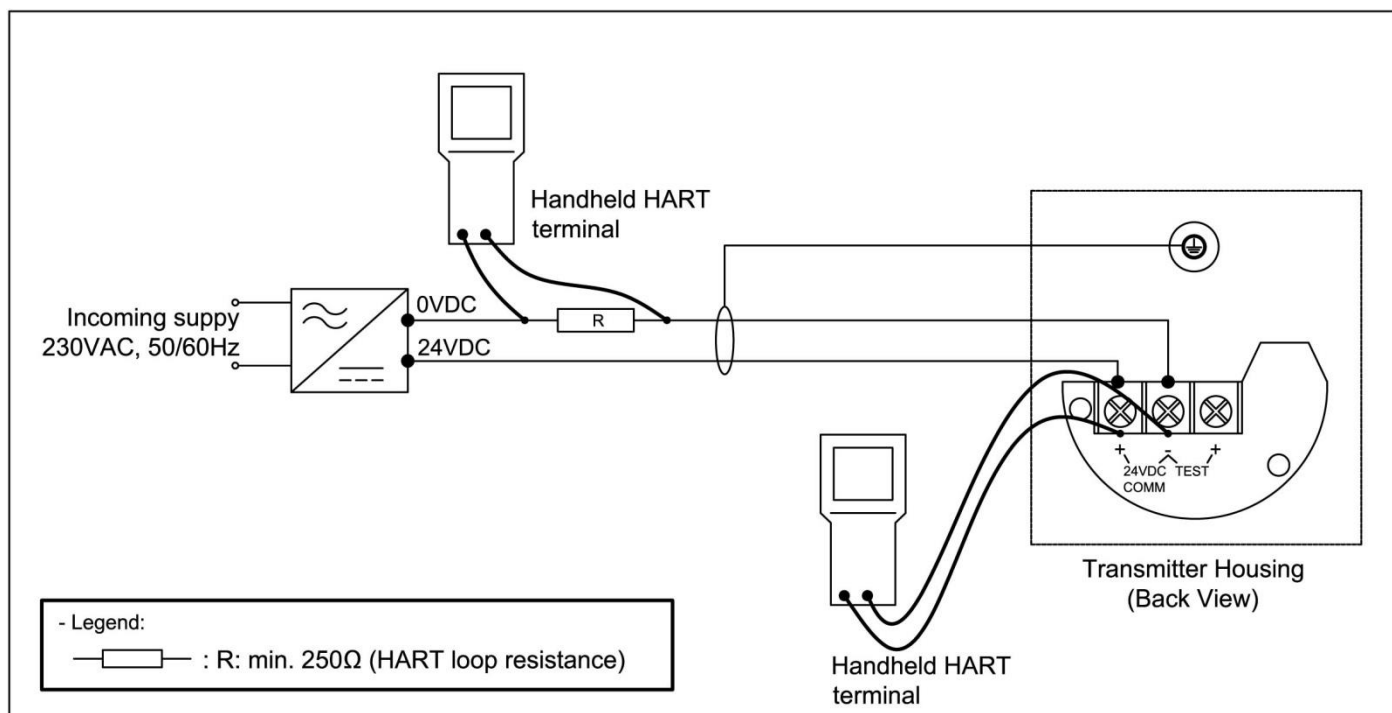


Figure 4.3 Wiring connection of HART configuration (Handheld HART Terminal)

4.2 Output Signal (4...20mA) Test

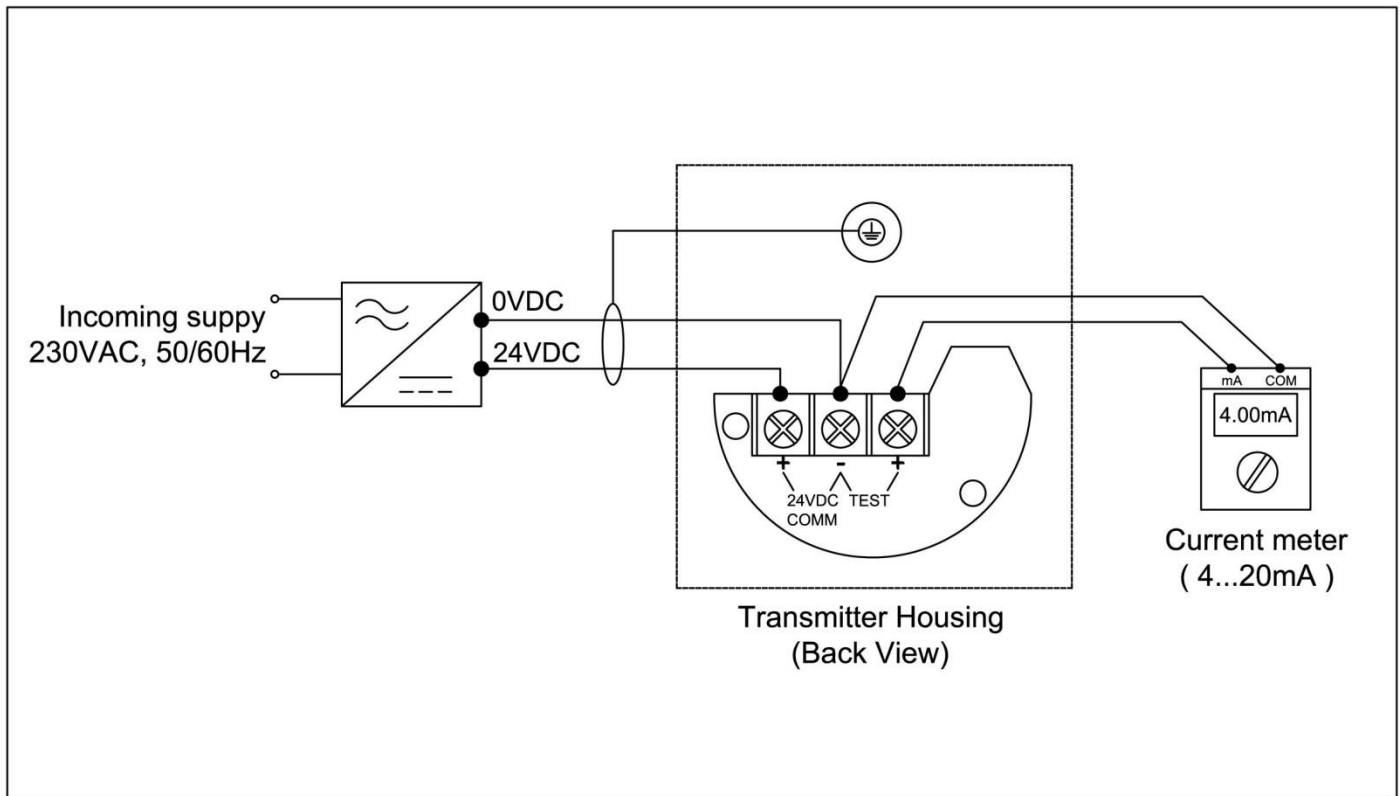


Figure 4.4 Test output signal (4...20mA)



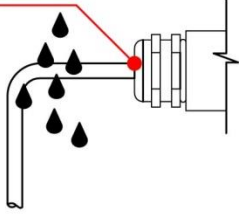
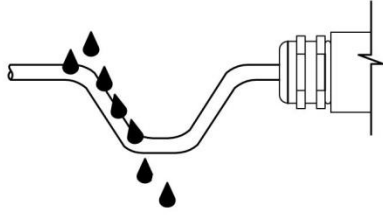
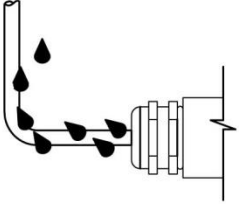
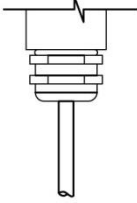
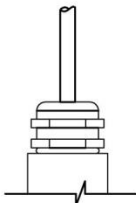
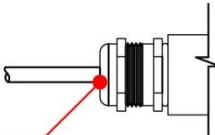
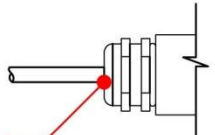
CAUTION !

- Do not apply high voltage (AC) to the transmitter, it will damage the transmitter

NOTE:

- Screen twisted pair cable is recommended for instrumentation termination
- Use shielded wire in high electrical noise area
- Install cable far away from electrical noise resources such as inverter, motor, inductive transformer, etc
- Avoid signal cable and power cable placed in the same duct for not affected by electrical noise
- Do not connect power supply cable to 'TEST' terminal, it will damage the component in 'TEST' connection
- The test output signal can be measured on terminal **TEST ' + ' & ' - '** without interrupt process measurement
- The internal circuit of display module is protected against reverse polarity
- Do not turn on power supply before the wiring job completed

4.3 Electrical Cable Entry

(a) Cable gland ✓ 	(b) ✓ 
(c) ✗ 	BLANK
(d) ✓ 	(e) ✗ 
(f) ✗ Cable gland MUST NOT loosen after cable installed 	(g) ✓ Cable gland MUST be firmly tightened after cable installed 

To achieve IP65 protection grade:

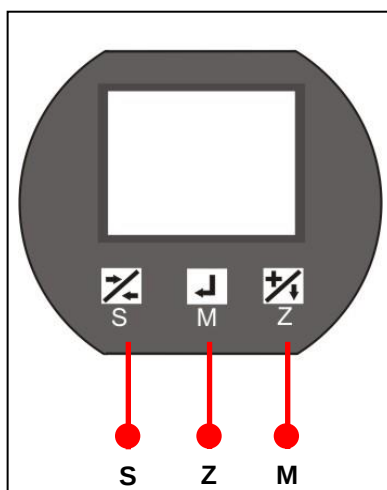
- To prevent moisture enter through cable entry, route the cable so that it loops down as shown in (a) and (b)
- Do not route the cable as shown (c)
- Do not face the cable gland upward as shown in (e) but face downward (d) to prevent water droplet direct flow into cable entry through the cable
- Firmly tighten the cable gland as shown in (g) after wiring termination done
- Do not let the cable gland cap loose (f) after wiring done
- Tighten the housing front and back cover after termination done



CAUTION !

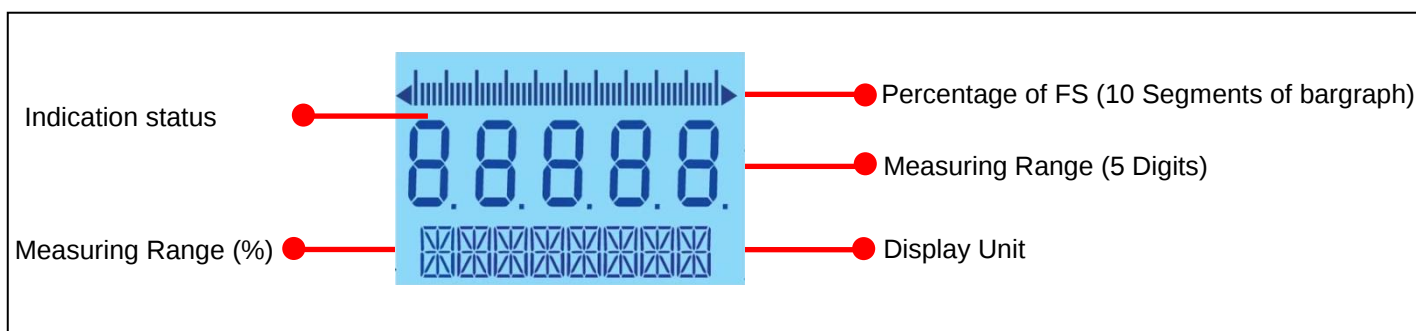
Ensure the front and back cover of the housing is fully close and tighten after configuration and wiring termination done in order to avoid entry of dust or moisture, else will reduce the life span of transmitter and cause electronic module malfunction

5.0 Parameter Configuration



Button	Description	
	<MODE>	- Enter menu page - Enter and save
	<ZERO>	- Select parameter to enter in menu page - Edit value in parameter page
		- Shift position function in parameter page - Return function to main display in menu page

Remarks: If there is no key pressed within 15second during setting mode, it will exit to measure mode automatically



Local LCD Display

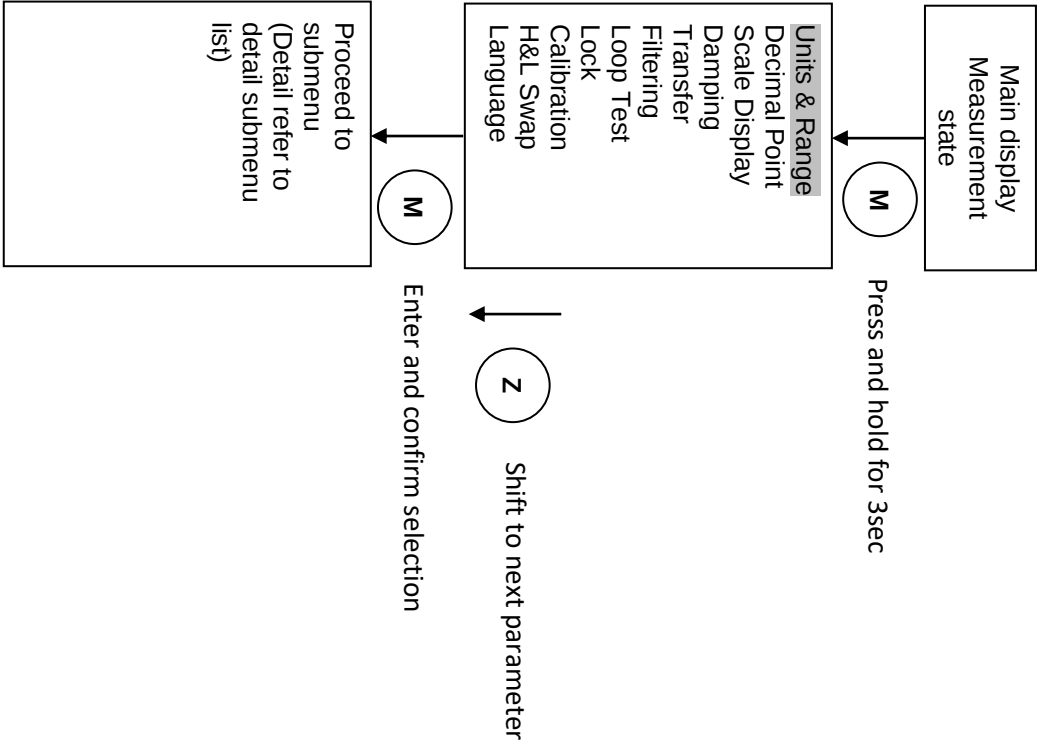
Indication Status	Description
PV	Process value measuring value (PV)
SV	Scale value (SV)
	Function lock
If required to perform setting via local display. Function lock required to off in order for setting that change take effect. Function lock disable setting guide can refer to Parameter Setting	



CAUTION!

Ensure the casing is fully close and tighten after configuration to avoid dust or moisture, else will reduce the life span of transmitter and cause electronic module malfunction

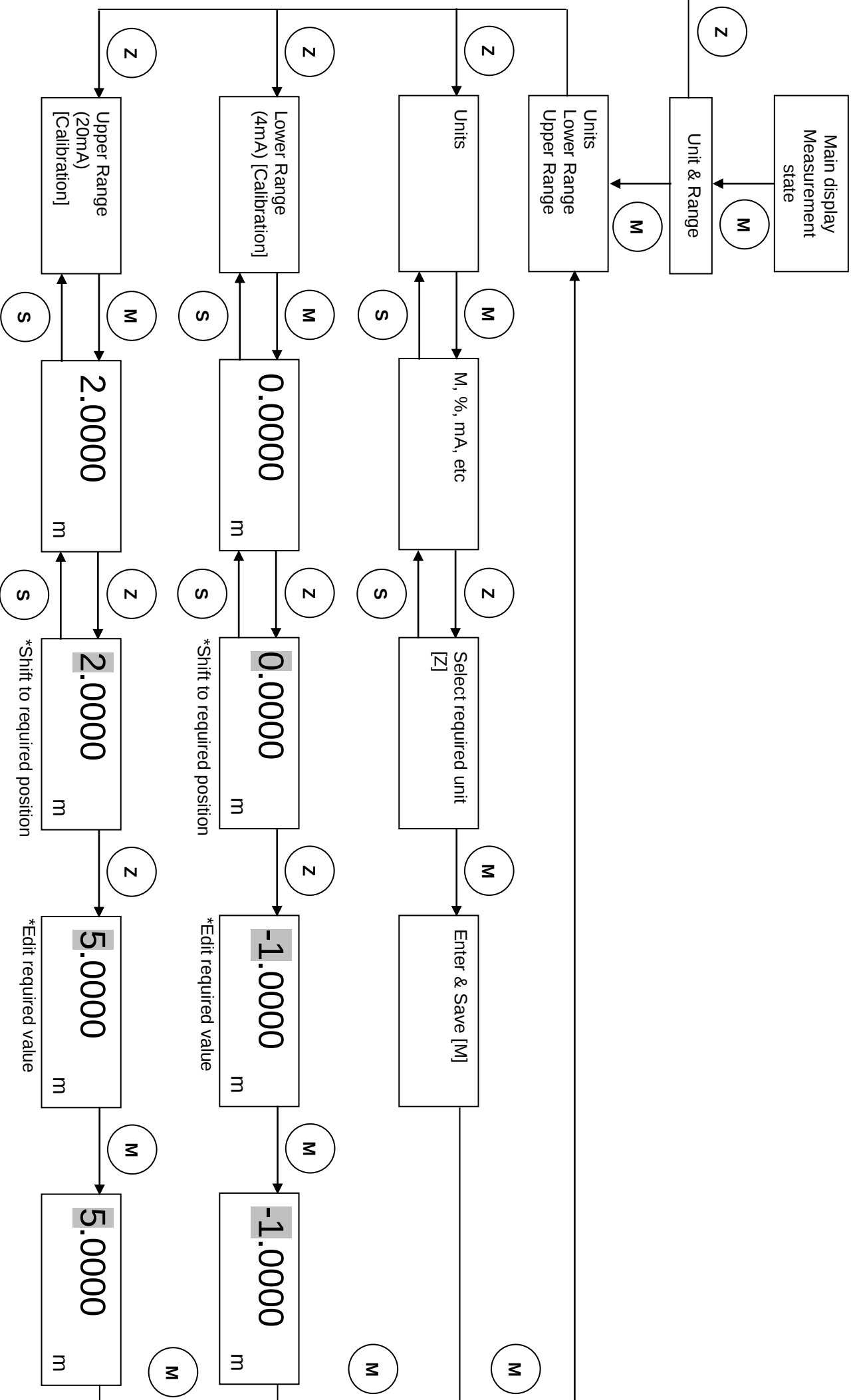
5.1 Parameter Setting List

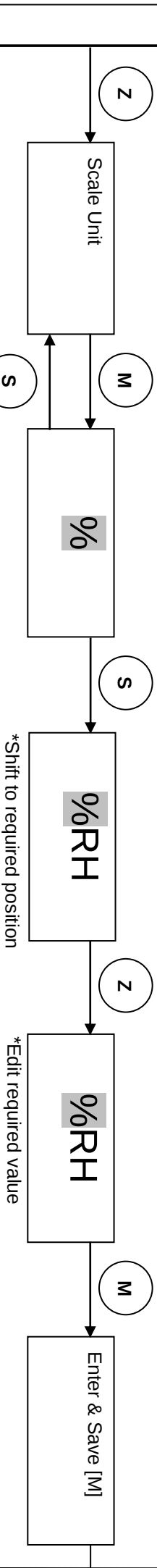
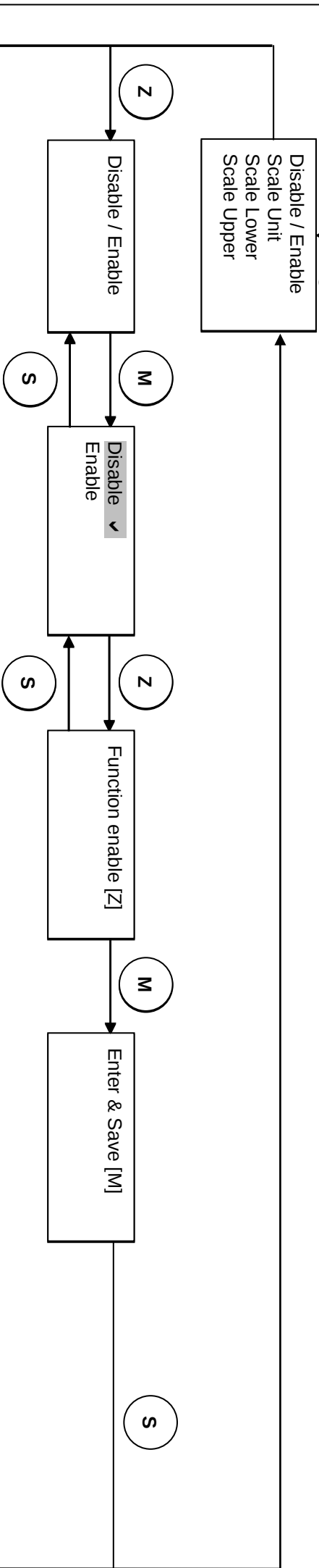
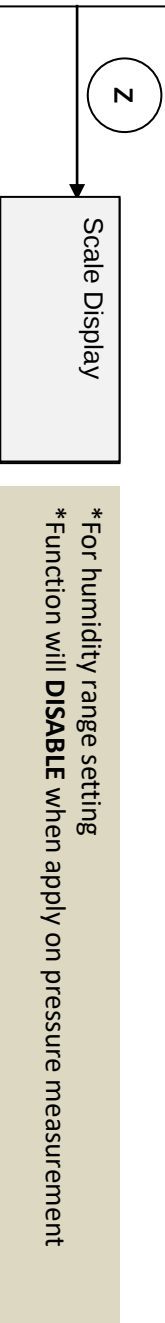
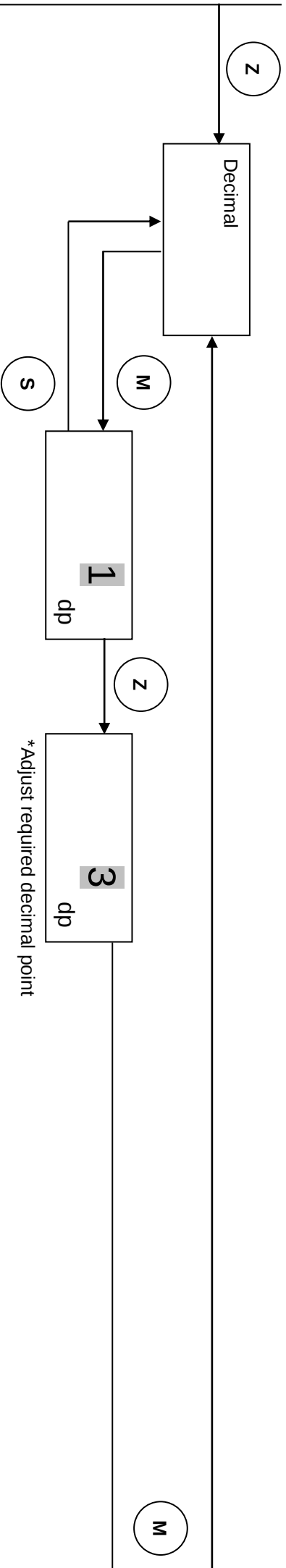


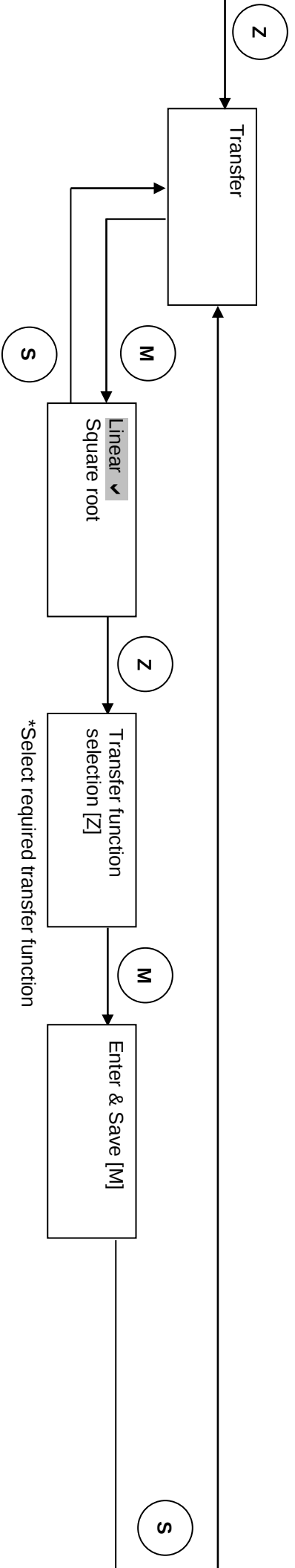
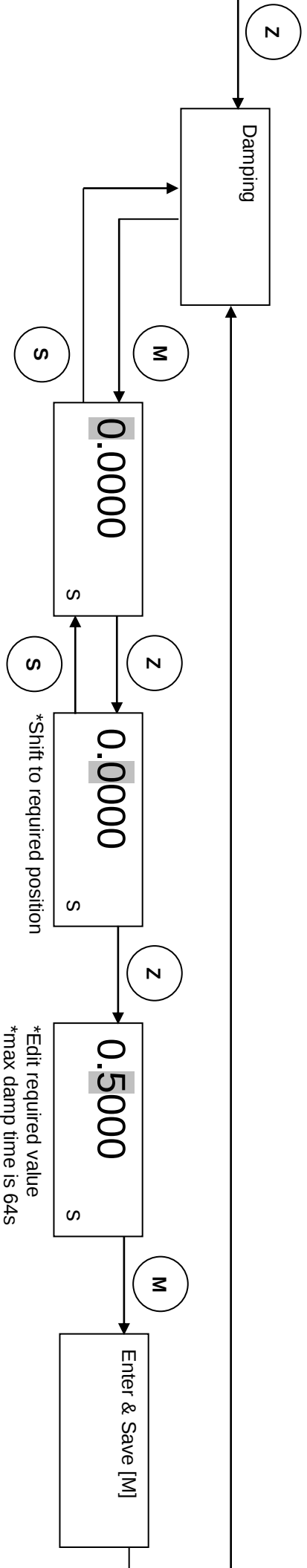
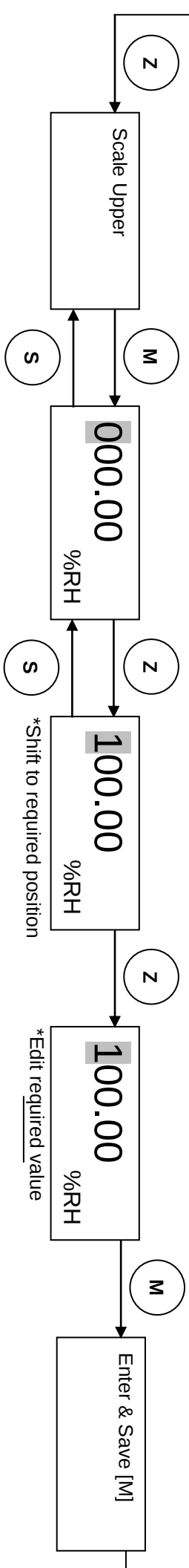
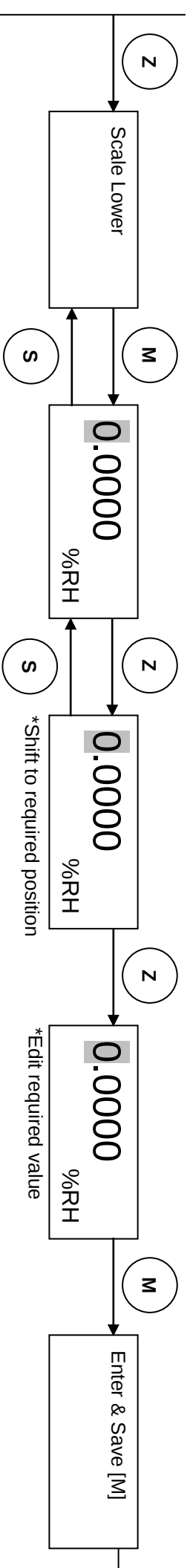
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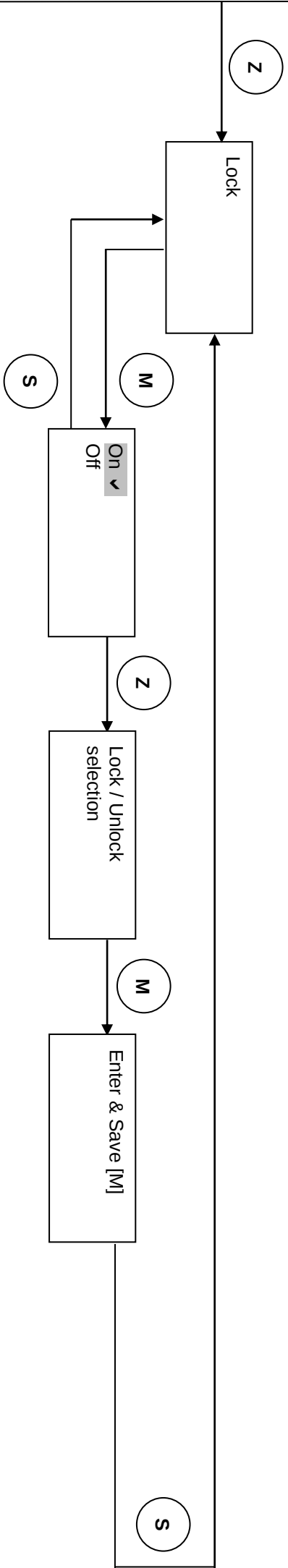
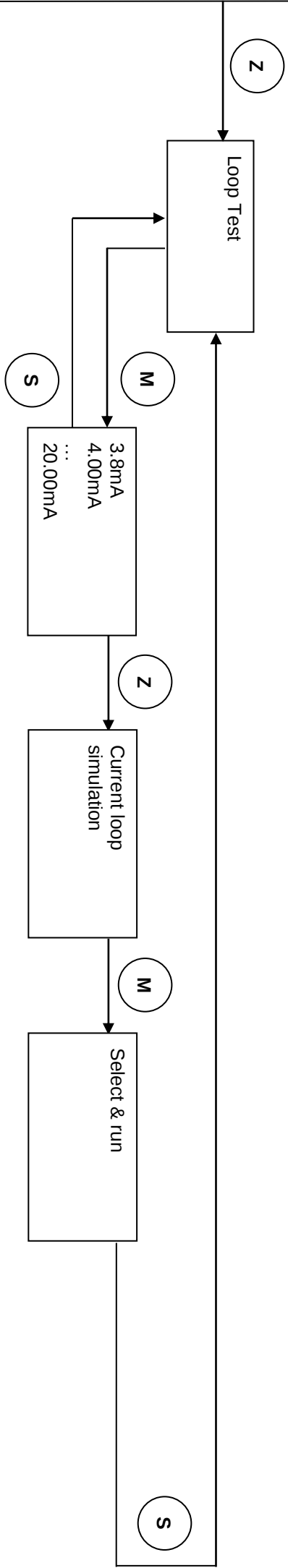
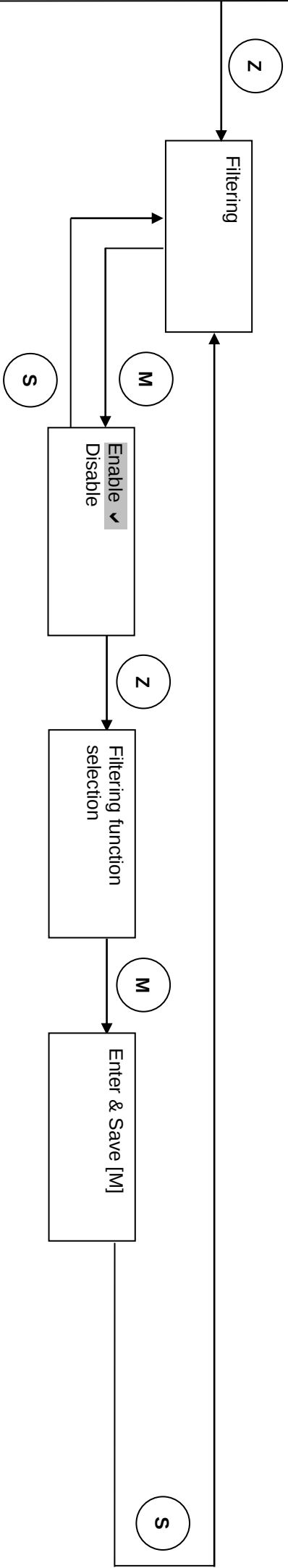
To perform screen rotation, press and hold button [S] for 3sec and release, the screen will rotate according angle 90degree each time press.

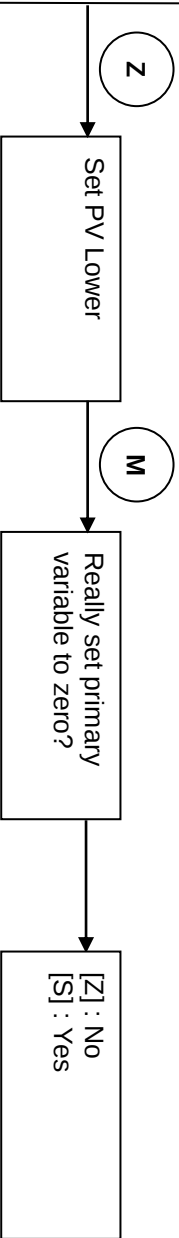
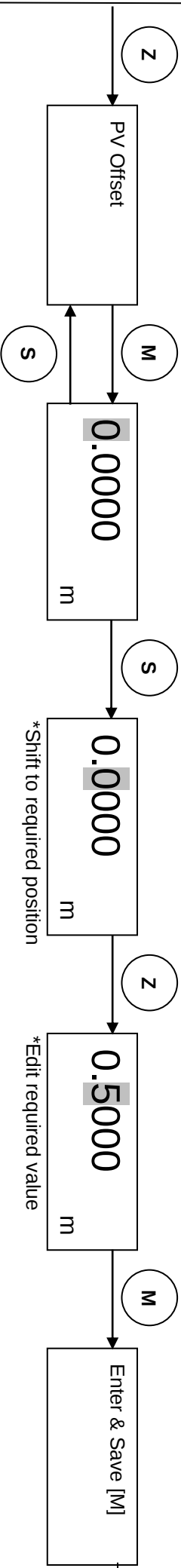
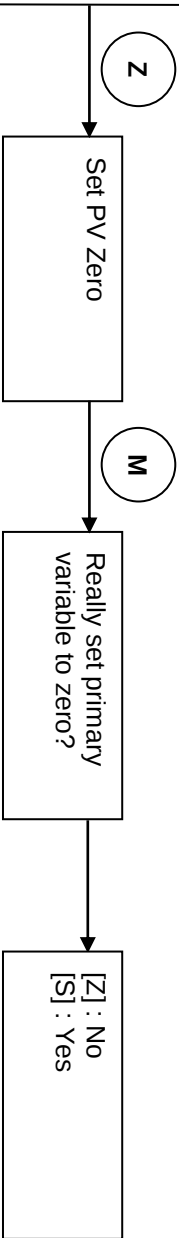
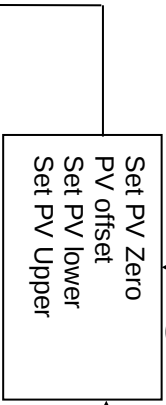
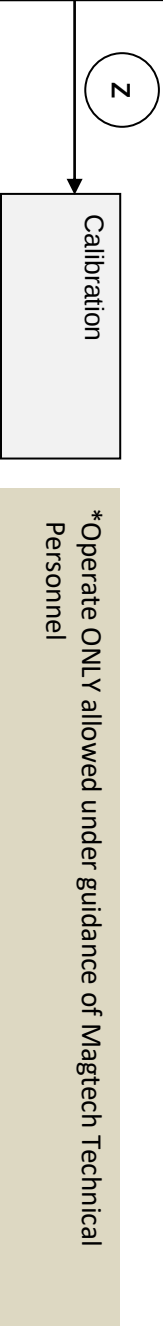
Detail Sub-menu List

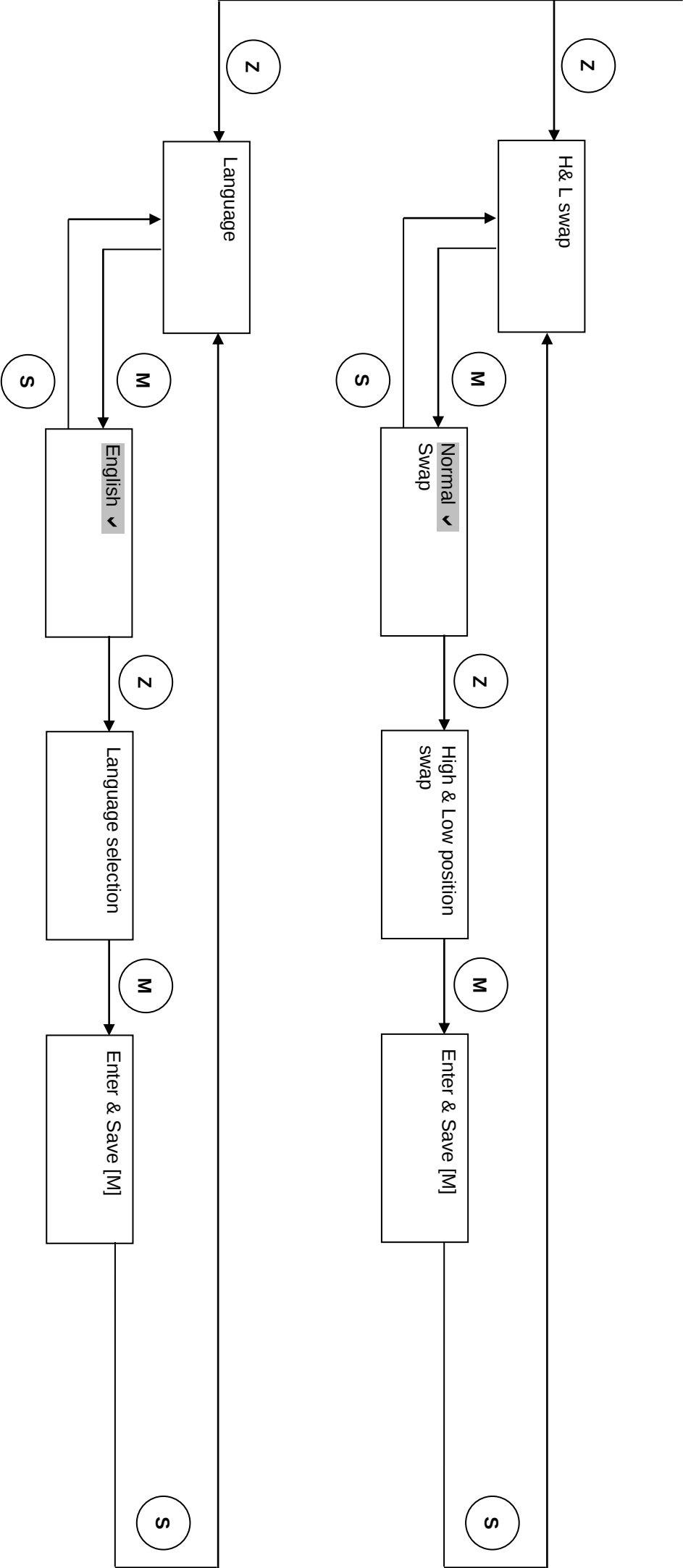












6.0 Troubleshooting Guide

No.	Symptom	Corrective Action
1	No output signal	(a) Check supply voltage polarity (b) Check wiring connection (open loop) (c) Verify the incoming supply voltage is sufficient (24VDC) (d) Electronic module faulty
4	Low output/ High output signal	(a) Check the cable of the transmitter whether place near or together with high electrical noise resources (Remark: Instrument cable MUST be isolated from high electrical noise resources) (b) Check the sensor probe whether covered with dirt (c) Sensor faulty
5	Transmitter unable communicate with PC using HART	(a) Check the loop resistance (250...550 Ω) (b) Check the setting in PC configuration (eg: Com Port) (c) Check wiring connection

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